

of the frequency-band selector and radiation counter in relation to the adjustable arm, and means to determine the content of a constituent element of the sample in response to the measured intensities.

4. An apparatus as defined in claim 3, in which the frequency-band selector of the Compton scattered radiation comprises a monochromating crystal preceded by an inlet diaphragm, the width of which is such that the monochromating crystal will select a wave band comprising at least 80 percent of the Compton radiation emitted by the sample.

5. An apparatus as defined in claim 3, in which the X-ray glow-tube has a divergent slit wide enough to allow irradiation of the total surface area of the irradiated sample.

6. An apparatus as defined in claim 3, in which during measurement of the intensity of the Compton scat-

tered radiation the position of the sample is maintained at an angle corresponding to the maximum angle of diffraction.

7. An apparatus as defined in claim 3, in which the frequency-band selector of the Compton scattered radiation comprises a double Ross filter.

8. An apparatus as defined in claim 3, in which each counter to measure the intensity of the diffracted and Compton scattered radiations contains two separate time-measurement instruments, one making an absolute measurement and the other operating in relation to the periodicity of the electrical current.

9. An apparatus as defined in claim 3, in which the sample holder consists of a thin film of a material with a very low scattering coefficient.

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